

What is claimed is:

1. A system for detecting at least one environmental condition in a room, said system comprising:

one or more detecting devices having a sensor configured to detect the at least one
5 environmental condition and to display the detected at least one environmental condition;

one or more reader devices configured to image the one or more detecting devices;

a controller configured to communicate with the one or more reader devices, wherein said
controller is operable to control said one or more reader devices and to receive the images from
the one or more reader devices, and wherein said controller is configured to determine the at least
10 one environmental condition based upon the images of the one or more detecting devices; and

a memory accessible by said controller, wherein said controller is configured to store the
at least one environmental condition in the memory.

2. The system according to claim 1, wherein the at least one environmental condition
15 comprises at least one of temperature, pressure and humidity.

3. The system according to claim 1, wherein the sensors of the one or more detecting
devices comprise at least one liquid crystal configured to change color depending upon the
temperature of the liquid crystal, and wherein the controller is configured to determine the at least
20 one environmental condition based upon the color of the at least one liquid crystal.

4. The system according to claim 3, wherein the at least one liquid crystal comprises
a plurality of liquid crystals, each said liquid crystal being configured to change color when its
temperature reaches a predetermined range.

5. The system according to claim 1, wherein the one or more detecting devices
comprise metallic foils and the sensors comprise liquid crystal coatings on said metallic foils.

6. The system according to claim 1, wherein the one or more detecting devices
30 comprises at least one of a mercury thermometer and a bi-metallic spiral spring thermometer.

7. The system according to claim 1, wherein the one or more detecting devices comprise identifying indicia configured to convey identification information.

8. The system according to claim 7, wherein the identifying indicia comprises at least one of text, barcode, color identity markers, or a display on a screen.

9. The system according to claim 7, further comprising:
means for determining the locations of the one or more detecting devices; and
wherein the controller is operable to store the locations of the one or more detecting devices along with the identification information of the one or more detecting devices in the memory.

10. The system according to claim 1, wherein the one or more detecting devices comprises a color calibration patch.

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11. The system according to claim 1, wherein the one or more detecting devices are attached to a substrate in the room via an insulating member.

12. The system according to claim 1, wherein the one or more reader devices comprise at least one of an imaging device and an infrared reader.

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13. The system according to claim 1, wherein the one or more reader devices are located on at least one of a wall, ceiling, or floor of the room, or an object in the room.

14. The system according to claim 13, wherein the one or more reader devices comprises at least one actuator configured to articulate the one or more reader devices.

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15. The system according to claim 1, wherein at least one of the one or more reader devices is attached to a robotic device configured to travel through the room.

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16. A method for measuring at least one environmental condition in a room, said method comprising:

preparing one or more detecting devices having a sensor configured to detect the at least one environmental condition and to display the detected at least one environmental condition;

5 positioning the one or more detecting devices in the room;

imaging the one or more detecting devices with one or more reader devices; and

determining the at least one environmental condition detected by the one or more detecting devices based upon the images of the one or more detecting devices.

10 17. The method according to claim 16, further comprising:

associating the one or more detecting devices with their locations in the room; and

storing the locations of the one or more detecting devices in a memory.

18. The method according to claim 17, wherein the step of preparing one or more
15 detecting devices comprises placing indicia relating to identification information of the one or more detecting devices on the one or more detecting devices;

determining the identities of the one or more detecting devices based upon the images of the one or more detecting devices; and

wherein the step of storing the locations of the one or more detecting devices comprises
20 storing the identification information of the one or more detecting devices in the memory.

19. The method according to claim 17, further comprising:

correlating the at least one detected environmental condition with the locations of the one or more detecting devices; and

25 determining a distribution of the at least one detected environmental condition based upon the correlation of the at least one detected environmental condition and the locations of the one or more detecting devices.

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20. The method according to claim 16, further comprising:
associating additional one or more detecting devices with their locations in response to a
detection of the additional one or more detecting devices;
imaging the additional one or more detecting devices; and
5 determining at least one environmental condition detected by the additional one or more
detecting devices based upon the images of the additional one or more detecting devices.

21. The method according to claim 16, wherein the sensors of the one or more
detecting devices comprise liquid crystals and wherein the step of determining the at least one
10 environmental condition detected by the one or more detecting devices comprises determining
the color of the sensors of the one or more detecting devices.

22. The method according to claim 16, further comprising:
positioning the one or more reader devices on a robotic device; and
15 maneuvering the robotic device to various positions in the room to image the one or more
detecting devices.

23. The method according to claim 16, further comprising:
positioning the one or more reader devices on at least one of a wall, floor and ceiling of
20 the room or an object in the room; and
articulating the one or more reader devices to image the one or more detecting devices
positioned at various locations of the room.

24. A method for controlling at least one environmental condition in a room, said
25 method comprising:
preparing one or more detecting devices having a sensor configured to detect the at least
one environmental condition and to display the detected at least one environmental condition;
positioning the one or more detecting devices in the room;
imaging the one or more detecting devices with one or more reader devices;

determining the at least one environmental condition detected by the one or more detecting devices based upon the images of the one or more detecting devices; and

manipulating one or more cooling system components in response to the at least one environmental condition falling outside of predetermined ranges.

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25. The method according to claim 24, wherein the step of manipulating one or more cooling system components comprises varying one or more of airflow through a vent and operation of an air conditioning unit.

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26. The method according to claim 24, further comprising:
associating the one or more detecting devices with one or more vent tiles and air conditioning units affect the at least one environmental condition of the one or more detecting devices; and

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wherein the step of manipulating one or more cooling system components comprises manipulating the one or more vent tiles and air conditioning units that affect the at least one environmental condition of the one or more detecting devices having the at least one environmental condition falling outside the predetermined range.

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27. A system for detecting at least one environmental condition in a room, said system comprising:

one or more infrared image sensors configured to sense temperatures of one or more locations in the room;

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a controller configured to communicate with the one or more infrared image sensors, wherein said controller is operable to control said one or more infrared image sensors and to receive temperature information from the one or more infrared image sensors, and wherein said controller is configured to determine the at least one environmental condition based upon the received information; and

a memory accessible by said controller, wherein said controller is configured to store the temperature information in the memory.

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28. The system according to claim 27, further comprising:

one or more metallic foil detecting devices positioned at various locations in the room,
wherein said one or more infrared image sensors are configured to image the one or more
metallic foil detecting devices to thereby determine the temperatures of the various locations in
5 the room.

29. A system for detecting at least one environmental condition in a room, said system
comprising:

means for detecting the at least one environmental condition;
10 means for imaging the means for detecting the at least one environmental condition; and
means for determining the at least one environmental condition from the means for
imaging the means for detecting.

30. The system according to claim 29, further comprising:

15 means for distinguishing a plurality of means for detecting from each other, said means
for distinguishing comprising identification information;
means for identifying locations of the plurality means for detecting;
means for correlating the identification information and the locations of the plurality of
means for detecting; and
20 means for storing the identification information, location information and the detected at
least one environmental condition.

31. The system according to claim 29, further comprising:

means for determining a distribution of the at least one environmental condition in the
25 room; and
means for varying one or more cooling system components based upon the distribution of
the at least one environmental condition in the room.

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32. The system according to claim 29, further comprising:

means for maneuvering the means for imaging around the room to obtain images of the means for detecting located at various positions in the room.

5 33. A computer readable storage medium on which is embedded one or more computer programs, said one or more computer programs implementing a method for measuring at least one environmental condition in a room, said one or more computer programs comprising a set of instructions for:

 implementing one or more reader devices to image one or more detecting devices having
10 a sensor configured to detect the at least one environmental condition and to display the detected at least one environmental condition; and

 determining the at least one environmental condition detected by the one or more detecting devices based upon the images of the one or more detecting devices.

15 34. The computer readable storage medium according to claim 33, said one or more computer programs further comprising a set of instructions for:

 associating the one or more detecting devices with their locations in the room; and
 storing the locations of the one or more detecting devices in a memory.

20 35. The computer readable storage medium according to claim 34, said one or more computer programs further comprising a set of instructions for:

 determining the identities of the one or more detecting devices based upon the images of the one or more detecting devices; and

 storing the identification information of the one or more detecting devices in the memory.

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 36. The computer readable storage medium according to claim 33, said one or more computer programs further comprising a set of instructions for:

 correlating the at least one detected environmental condition with the locations of the one or more detecting devices; and

determining a distribution of the at least one detected environmental condition based upon the correlation of the at least one detected environmental condition and the locations of the one or more detecting devices.

5 37. The computer readable storage medium according to claim 33, said one or more computer programs further comprising a set of instructions for:

 determining the color of the sensors of the one or more detecting devices to determine the detected at least one environmental condition.

10 38. The computer readable storage medium according to claim 33, said one or more computer programs further comprising a set of instructions for:

 implementing a robotic device having the one or more reader devices; and

 maneuvering the robotic device to various positions in the room to image the one or more detecting devices.

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 39. The computer readable storage medium according to claim 33, said one or more computer programs further comprising a set of instructions for:

 implementing one or more reader devices attached on at least one of a wall, floor and ceiling of the room or on an object in the room; and

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 articulating the one or more reader devices to image the one or more detecting devices positioned at various locations of the room.